I claim:

1. A surgical instrument, comprising:

a member made of a shape memory alloy arranged to be inserted into a patient,

wherein when said member is exposed to an irrigation fluid having a temperature higher than a body temperature of the patient, the member assumes a predetermined shape to perform a surgical function.

2. A surgical instrument as claimed in claim 1, wherein the shape assumed by the member is a coil shape, the member thereby serving as a urological retrieval coil.

3. A surgical method, comprising the steps of inserting a surgical instrument made of a shape memory alloy into a patient; and causing the surgical instrument to assume a predetermined shape by irrigating the surgical instrument with irrigating fluid having a temperature higher than a body temperature of the patient.

4. A surgical method as claimed in claim 3, wherein the shape assumed by the member is a coil shape, the member thereby serving as a urological retrieval coil.

5. An apparatus and method for causing the distal end of a surgical instrument to bend and/or twist when the temperature of a shape memory alloy in the apparatus' structure is increased above its austinitic transition temperature.

6. An apparatus and method of Claim 5, wherein the austinitic transition temperature of the shape memory alloy is adjusted to be several degrees above the typical temperature of a human body (98.6 degrees F).

7. An apparatus and method of Claim 6, wherein a temperature of the shape memory alloy is changed by changing the temperature of the irrigating fluid which surrounds the shape memory alloy.

8. An apparatus and method of Claim 6, wherein a temperature of the shape memory alloy is changed by controlling the magnitude of an electrical current flowing through the shape memory alloy.

9. An apparatus and method of Claim 6, wherein a temperature of the shape memory alloy is changed by controlling the amount of radiant energy incident on or in the vicinity of the shape memory alloy.

10. An apparatus consisting at least in part of a wire or tube of shape memory alloy that is substantially straight at or below the temperature of the human body but assumes a more complex shape, such as that of a urological retrieval coil, at some higher temperature.

11. A method whereby the apparatus in Claim 10 is arranged to be positioned to a desired location by a surgeon while the shape memory alloy wire or tube is substantially straight (at or below the body temperature) and then caused to transform to a complex shape by increasing the temperature of the shape memory alloy.

12. A method whereby a deployed apparatus as in Claim 7 is retracted from its location by first reducing the temperature of the shape memory alloy to some value below its martinsitic transition temperature.